

**UNITED STATES DISTRICT COURT  
FOR THE MIDDLE DISTRICT OF NORTH CAROLINA**

JJG IP Holdings, LLP  
a New Hampshire corporation, and  
Green Machine Sales LLC,  
a New Hampshire corporation,

Plaintiffs,

Civil Action No.1:19-cv-437

**COMPLAINT WITH  
JURY DEMAND**

v.

Machinex Industries, Inc.,  
Machinex Technologies Inc., and  
Curbside Management, Inc.,

Defendants.

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Plaintiffs JJG IP Holdings, LLC ("JJG") and Green Machine Sales LLC ("Green Machine") (collectively, "Plaintiffs"), for their Complaint with Jury Demand against the above-named Defendants Machinex Industries, Inc., Machinex Technologies Inc. (collectively, "Machinex"), and Curbside Management, Inc. ("Curbside") (collectively "Defendants"), allege the following:

**I. NATURE OF THE ACTION**

1. This is an action for patent infringement arising under the Patent Laws of the United States, 35 U.S.C. § 1 *et seq.*

**II. THE PARTIES**

2. JJG is a corporation organized under the laws of the State of New Hampshire, having a place of business at 5 Gigante Drive, Hampstead, New Hampshire 03841.

3. Green Machine is a limited liability corporation organized under the laws of the State of New Hampshire, having a place of business at 5 Gigante Drive, Hampstead, New Hampshire 03841.

4. Machinex Industries, Inc. is a Canadian corporation with a place of business at 2121 Oliver Street, Plessisville QC, G6L 3G9, Canada.

5. Machinex Technologies Inc. is a corporation organized under the laws of the State of North Carolina, having a place of business at 716 Gallimore Dairy Road, Suite 103, High Point, North Carolina 27265.

6. Curbside is a corporation organized under the laws of the State of North Carolina, having a place of business at 116 N. Woodfin Avenue, Asheville, North Carolina 28804.

### **III. JURISDICTION AND VENUE**

7. This is an action for patent infringement arising under the patent laws of the United States, Title 35 of the United States Code.

8. This Court has subject matter jurisdiction over the asserted claim under 28 U.S.C. §§ 1331 and 1338.

9. Defendants are subject to personal jurisdiction in this judicial district because: (1) they regularly conduct business within and have had systematic and continuous contacts with this judicial district; (2) the activities giving rise to Plaintiffs' claims occurred, at least in part, within this judicial district; and (3) Plaintiffs have been damaged in at least this judicial district by Defendants' tortious conduct.

10. Venue is proper in this judicial district under 28 U.S.C. §§ 1391 and 1400(b) because Defendants reside in and/or have a physical presence in this district, they have offered infringing product for sale in and sold infringing product into this district, and at least a part of the events giving rise to the asserted claim and of the resulting damage occurred in this district.

#### **IV. GENERAL ALLEGATIONS**

##### **A. Green Machine and the Green Eye® Optical Sorter**

11. Green Machine was founded in 2005 by John Green, an engineer with well over 40 years of experience designing systems for the recycling industry. Mr. Green's goal in founding Green Machine was to create unique designs for recycling system components, including optical sorters, separation systems, and conveyors. Since then, Green Machine has been in the business of manufacturing and selling innovative recycling, waste processing and sorting equipment and systems for a broad range of applications and for use across industries. Its innovative and category leading products and resultant stellar reputation have been built upon, among other things, its distribution and placement of highly trained engineers at its two manufacturing facilities in New Hampshire and New York. Having engineers on-site to oversee manufacture of its products ensures that Green Machine's products are continually improved, held to the highest standards, and pass multiple quality assurance tests. Over time, Green Machine has come to be known as an innovative and respected leader in the recycling industry, with its "Green" brand of components.

12. One of Green Machine's product lines is directed towards automated identification and sorting of recyclable materials collected by waste management companies and the like. While previous attempts at automating sorting of materials collected by such organizations was attempted, even using optical systems, the systems were either entirely unreliable or limited in material selection capabilities and exhibited poor material separation capabilities.

13. Specifically, in 2008, sorting systems used single trace spectral spectroscopy and color sorter imaging and were primarily single- or dual-use sorters focused on separating plastics from mixed material streams. Around this time, Green Machine customers had a need for multi-use sorters that could be used for multiple sorting applications and that were not limited only to the sorting of plastics. Mr. Green worked with Green Machine's Principal Engineer, Peter Mendre, and set out to develop a sorter system that used hyperspectral analysis to effectively and efficiently sort these variable types of recyclables from a material stream comprised of numerous different material types. At that time, the commercially available vision systems lacked the speed, flexibility and sort quality to be a precise recycling solution for customers.

14. In developing Green Machine's optical sorter, Messrs. Green and Mendre identified that then existing optical sorting systems used single dimension spectroscopy, i.e., capturing only typical bands of the electromagnetic spectrum, like infrared, red, green, and blue. Messrs. Green and Mendre began experimenting with the use of multi-dimensional hyperspectral imaging, involving the collection of the discrete narrow spectra

at every pixel in an image on a multi-dimensional spectral plane, collecting spectra tied to specific locations of each pixel. At the time of this experimentation, hyperspectral imaging was not part of the state of the art in optical recycling systems.

15. Messrs. Green and Mendre found that by looking at many narrow spectral bands, such as ultraviolet or infrared spectra, the devised method could analyze materials much faster and more accurately than existing traditional spectral systems. In addition, Messrs. Green and Mendre found that not all spectral bands were relevant to recyclable material. By taking advantage of this fact, they were able to limit relevant data to be collected and focus on very narrow and group specific wavelengths of information in their sorting process. These developments reduced information processing computations, eliminating unnecessary data that had resulted in increased levels of uncertainty in material classification algorithms.

16. Shortly after Green Machine introduced its new and improved optical sorter and system, with the sorter called the Green Eye® Optical Sorter, a large demand for the product began to emerge in the recycling industry. That demand was due to the fact that customers finally had a solution that provided versatile, reliable and efficient sorting of a host of materials from typical mixed material streams.

17. In particular, the Green Eye® Optical Sorter included hyperspectral imaging technology that was ground breaking in its ability to sort previously unsortable materials. For instance, black plastics, which are important to auto scrap and industrial recyclers, could now be sorted. Chlorine-based plastics, such as PVC and vinyl, could also now be

identified and removed from the waste stream prior to their disposal at waste energy plants, extending the life of the plants' burn chambers and thereby raising the value of the feed stock. Yet another example of enhanced sorting facilitated by this new technology was the ability to identify arsenic-laden pressure treated wood, which could now be differentiated from natural wood and removed prior to power generation. Sorting all recyclable paper grades was also facilitated by the newly invented hyperspectral technologies. All this sorting is accomplished at clean pick rates of up to 99%, meaning the target materials being separated from the material stream contain up to 99% of the target material, enabling acceptance of the collected materials by ever more particular export market participants.

18. Since the introduction of the Green Eye® Optical Sorter, Green Machine has sold many systems that include the Sorter for a multitude of uses, resulting in sales totaling in the tens of millions of dollars. The Green Eye® Optical Sorter's success is directly attributable to its efficiency, speed, and accuracy over products offered by more established companies. Unit sales are usually in the dozens, as the Sorters are large and expensive, as reflected in the photograph of the side of a Green Eye® Optical Sorter:



19. The success of Green Machine's Green Eye® Optical Sorter is also attributable to its multi-application use in a variety of markets and industries, including: 1) municipal solid waste recycling; 2) plastics recovery from various material streams; 3) single stream recycling; 4) construction and demolition waste recycling; 5) mixed scrap metal stream recycling; 6) commercial dry waste recycling; 7) fiber sorting; 8) textile recycling; 9) waste to energy systems; and 10) food and agricultural sorting systems.

20. It is thus of little surprise to Plaintiffs that, subsequent to Green Machine's successful development of its Green Eye® Optical Sorter, Green Machine's competitors have recently adopted the hyperspectral imaging technologies invented by Messrs. Green and Mendre into their own sorting systems.

**B. Plaintiffs' Infringed Patent Rights**

21. To protect Green Machine's substantial investment in its Green Eye® Optical Sorter technologies, Mr. Green and Mr. Mendre sought and were granted U.S. Patent No. 9,950,346 ("the '346 Patent"), entitled "Method and Apparatus for Sorting Recycled Material," which was duly and legally issued by the United States Patent and Trademark Office ("USPTO") on April 24, 2018 from an application filed on April 23, 2014. The '346 Patent has an earliest priority date of November 18, 2008. (A copy of the '346 Patent is attached as Ex. 1 and is incorporated herein by reference.)

22. Mr. Green obtained the '346 Patent to ensure that competitors would not unfairly copy Green Machine's innovations and incorporate them into a competing product that, due to the copying, could be sold at competitive prices.

23. Messrs. Green and Mendre assigned the '346 Patent to JJG, which at all relevant times has owned and owns all rights, title, and interest in and to the '346 Patent. Green Machine exclusively licenses the '346 Patent from JJG.

24. Representative Figures 1 and 2, along with a key to the components, from the '346 Patent show an embodiment of the disclosed and claimed optical sorting system:

Component No.	Description
1	Conveyor/accelerator belt
2	Air knife
3	Computer system
4	Camera enclosure
5	Array of lights
6	Camera
7	Receiving hood area
8	Blower
9	Collection point

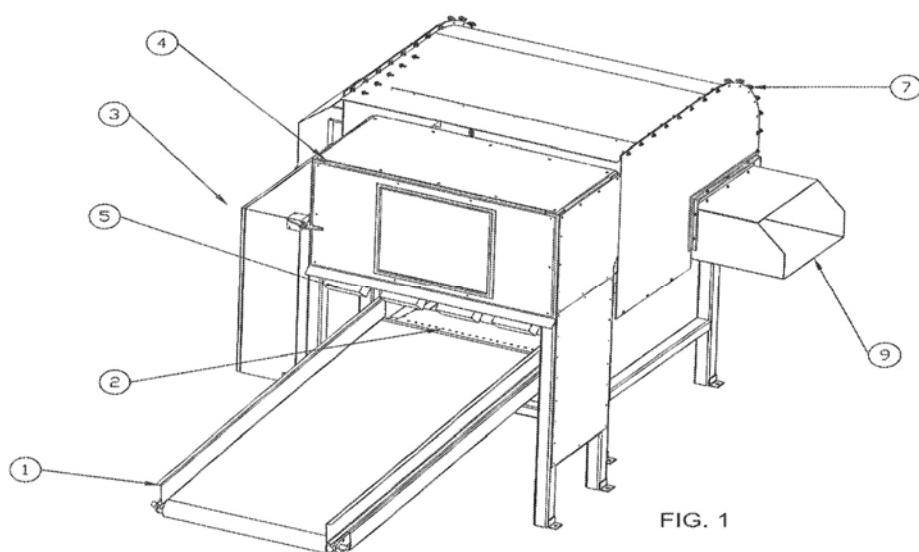


FIG. 1

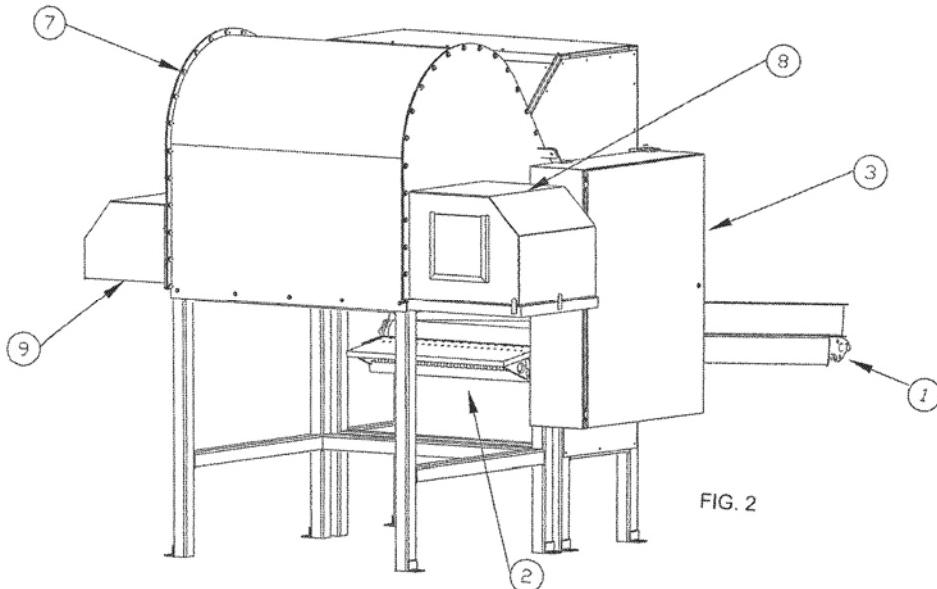


FIG. 2

25. The '346 Patent has two independent claims and sixteen claims overall.

Independent claim 1 of the '346 Patent is set forth in its entirety below:

1. A system for the identification and sorting of heterogeneous material, the system comprising:

a hyperspectral identification system for capturing spectra of material, said hyperspectral identification system comprises at least one hyperspectral camera said hyperspectral camera configured to receive spectral data from a plurality of selected spectral bands of infrared and visible light corresponding to spectral signatures of target materials to be identified if present in said heterogeneous material and spacial data locating a position of said heterogeneous materials on a solid belt; said camera disposed proximate to a visible or infrared light source, said light source and said at least one hyperspectral camera are disposed on the same side of a stream of said heterogeneous material;

said solid belt having first and second ends, said belt running beneath said hyperspectral identification system and upon which said heterogeneous material is conveyed from said first end to said second end, said belt traveling at a preset rate, said hyperspectral identification system being disposed over said second end of said belt;

a computer configured to receive and analyze data from said hyperspectral identification system, to identify target materials of a first user defined category from among said heterogeneous materials, identify the spatial position of said target materials, and to trigger an ejection system at a preset time delay equal to the distance between said camera and said ejection system divided by the rate of travel of the belt; and

    said ejection system disposed immediately after said second end of said belt, whereby said desired materials are separated from said heterogeneous material, said ejection system being triggered by said computer.

26. Independent Claim 14 of the '346 Patent is set forth in its entirety below:

14. A method for sorting heterogeneous material, said method comprising:

    reflecting visible or infrared light from the surface of said heterogeneous material disposed on a conveyer from a light source disposed proximate to a hyperspectral imager;

    conveying said heterogeneous material at a predetermined rate beneath said hyperspectral imager;

    generating hyperspectral images containing both spectral and spatial data of said heterogeneous material by receiving a plurality of selected spectral bands of infrared and visible light corresponding to spectral signatures of target materials to be identified if present in said heterogeneous material as said heterogeneous material passes on said conveyer beneath said hyperspectral imager;

    comparing said hyperspectral images of said heterogeneous material to hyperspectral images of known materials;

    identifying said target materials;

    activating an ejection system with a computer, said computer being configured to physically isolate target material with said ejection system from said heterogeneous material by locating said target material within said heterogeneous material and ejecting said target material with said ejection system at a preset time delay equal to a distance between said hyperspectral imager and said ejection system divided by a rate of conveying said heterogeneous material.

27. JJG is also the assignee of one or more continuation patent applications directed to the various technologies disclosed in the original patent application. Those applications will issue in due course and it is anticipated claims thereof will also be relevant to the activities of Machinex.

**C. Machinex Copies the Green Eye® Optical Sorter**

28. Machinex is a longtime competitor of Green Machine in the area of waste and recycling sorting technologies. At the 2015 Waste Expo, an industry trade show, Machinex introduced its hyperspectral optical sorter. That system infringed Green Machine's Canadian Patent No. 2,688,805. Mr. Green hand delivered a letter to Chris Haan of Machinex, which informed Machinex of its infringement. Later, Mr. Green spoke with Machinex's CEO, Pierre Paré, who assured Mr. Green that Machinex had no prior knowledge of Green Machine's Canadian patent. At that time, Green Machine decided to take no further action as it believed there was no infringement by Machinex in the U.S., but Mr. Green did tell Mr. Paré that U.S. patents were being pursued and the issues would be revisited when those issued.

29. Green Machine recently learned Machinex introduced an optical sorting machine called the MACH Hyperspec into the U.S. market. The system is shown below:



(The product brochure depicting and describing the product is attached hereto as Ex. 2 and is incorporated herein by reference.)

30. Like the Green Eye® Optical Sorter, the MACH Hyperspec also uses hyperspectral optical detection to detect different material types present in a mixed material, material stream, and can also be used in different types of material recovery facilities, such as single-stream, construction and demolition, municipal solid waste and other common industrial sorting applications. Similarly, the MACH Hyperspec touts that its system takes less than 1 millisecond to analyze materials passing under a scanner on a high-speed conveyor belt. (A copy of an article advertising and describing the MACH Hyperspec is attached hereto as Ex. 3 and is incorporated herein by reference.)

31. Upon information and belief, the MACH Hyperspec copies the hyperspectral optical technology developed by Green Machine for the Green Eye® Optical Sorter and the inventive system described in independent Claim 1 in the '346 Patent. Further, use of the MACH Hyperspec copies the method described in independent Claim 14 in the '346 Patent. In short, Machinex has directly and indirectly infringed multiple claims of the '346 Patent.

32. Importantly, Machinex obtained U.S. Patent No. 9,316,596 entitled "Apparatus and Method for Inspecting Matter and Use Thereof For Sorting Recyclable Matter" ("the '596 Patent"). Claim 1 from that patent is shown below:

1. An apparatus for inspecting recyclable matter, said apparatus comprising:

a lighting unit for projecting a concentrated diffused lighting onto at least a portion of said recyclable matter to generate a specular reflected light beam representative of the inspected recyclable matter;

an imaging unit mounted according to a given imaging angle with respect to the projected concentrated diffused lighting for imaging at least a portion of the specular reflected light beam to provide spectral data representative of the inspected recyclable matter;

an analyzing unit operatively connected to the imaging unit for analyzing the spectral data and providing recyclable matter characterization databased on the at least a portion of the specular reflected light beam representative of the inspected recyclable matter, and wherein the specular reflected light beam comprises specular rays selected from a group consisting of specular rays of second surface, specular ray of third surface, specular rays of fourth surface and specular rays of a supporting surface supporting said recyclable matter.

33. In short, the '596 Patent is directed to a particularly narrow feature of Machinex's hyperspectral system. Further, it is doubtful Machinex would have even been

granted these patent claims had it bothered to cite to the USPTO, as it had a duty to do, the JJG patents and published applications of which it was made aware in 2015.

34. Also, upon information and belief, in an attempt to take Green Machine's product sales, Machinex is offering the MACH Hyperspec to customers in the U.S. at a similar or lower price than Green Machine can offer the Green Eye® Optical Sorter system. Upon information and belief, Machinex can only offer the MACH Hyperspec for sale at such prices because it copied Green Machine's innovative and patented features, rather than investing in its own research and development to create its own innovative features.

35. In fact, it is believed that Green Machine has already lost sales of its Green Eye® Optical Sorter system to Machinex. Curbside is in the business of collection, processing, and marketing recyclable materials separated from residential, commercial, and industrial mixed material streams collected from various counties in North Carolina. Upon further information and belief, Curbside processes these materials at its Material Recovery Facility, located at 116 North Woodfin Avenue, Asheville, North Carolina, where it processes and ships in excess of 1,000 tons of material of month. It is further believed that sometime in 2018, Curbside decided not to purchase a hyperspectral optical sorting system from Green Machine, instead accepting a proposal from Machinex and then purchasing the MACH Hyperspec from Machinex, and is now using that machine at its Material Recovery Facility.

36. In addition, it is believed that Boulder County Recycle, another Green Machine customer, chose to purchase a MACH Hyperspec over Green Machine's Green

Eye® Optical Sorter. Machinex has also sold the infringing system, upon information and belief, to Progressive Waste of Miami, Florida, Rumpke Waste Systems of Ohio, PDC Area Disposal Services of Peoria, Illinois, and certainly others.

37. Defendants' unauthorized manufacture of, sale of, offers to sell, and/or use of the MACH Hyperspec in the U.S. has caused and will continue to cause substantial and irreparable harm to Plaintiffs, including, but not limited to, irreversible price erosion and loss of market position.

**V. FIRST CLAIM FOR RELIEF**  
**(Patent Infringement Under 35 U.S.C. § 271 – U.S. Patent No. 9,950,346)**

38. The allegations set forth in the foregoing paragraphs 1 through 37 are hereby realleged and incorporated herein by reference.

39. Defendants have directly and literally, or in the alternative under the doctrine of equivalents, infringed one or more claims of the '346 Patent, in violation of 35 U.S.C. § 271, in this judicial district and elsewhere by making, using, selling, and/or offering for sale a product or products that infringe one or more claims of the '346 Patent ("Accused Products"). Machinex has also induced and contributed to the direct literal, or in the alternative under the doctrine of equivalents, infringement of one or more claims of the '346 Patent, in violation of 35 U.S.C. § 271, in this judicial district and elsewhere by making, using, selling, and/or offering for sale Accused Products.

40. Upon information and belief, Defendants' Accused Products include but may not be limited to the MACH Hyperspec. Discovery will be needed to confirm the full nature and scope of Machinex's infringing conduct.

41. Because of Defendants' infringement of the '346 Patent, Plaintiffs have suffered and will continue to suffer irreparable harm in this judicial district.

## **VI. PRAYER FOR RELIEF**

WHEREFORE, Plaintiffs pray for judgment in their favor and against Defendants as follows:

- a. That Defendants have infringed one or more claims of the '346 Patent;
- b. That Defendants, their officers, directors, agents, servants, employees, privies, representatives, attorneys, parent and subsidiary corporations or other related entities, successors, assigns, licensees, retail distributors, and all persons in active concert or participation with any of them, be preliminarily and permanently enjoined from further acts of infringement of the '346 Patent;
- c. That Plaintiffs be awarded damages in an amount to be determined at trial for Defendants' infringing activities, which are at least a reasonable royalty;
- d. That Plaintiffs be awarded treble damages by reason of any willful, wanton, and deliberate infringement found under 35 U.S.C. § 284;
- e. That Plaintiffs be awarded their pre-judgment and post-judgment interest;
- f. That Plaintiffs be awarded their costs and expenses of suit, including expert witness fees;
- g. That Plaintiffs be awarded their attorneys' fees should this be found to be an exceptional case under 35 U.S.C. § 285;

- h. That Defendants be ordered to deliver to Plaintiffs, for destruction at Plaintiffs' option, all products that infringe the '346 Patent;
- i. That Defendants be required to account for all gains, profits, advantages, and unjust enrichment derived from its violations of law; and
- j. That Plaintiffs be awarded other and further relief as the Court deems appropriate and just.

**VII. JURY DEMAND**

Plaintiffs demand a trial by jury on all issues so triable.

Respectfully submitted,

Dated: April 24, 2019

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